

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently amended) A method of manufacturing a semiconductor device comprising the steps of: ~~wherein a material having a tensile stress of  $8 \times 10^9$  dynes/cm<sup>2</sup> or more is formed in contact with a semiconductor film that is formed on a substrate, whereby an impurity element in said semiconductor film is gettered into said material.~~

forming a semiconductor film over a substrate; and

forming a material having a tensile stress of  $8 \times 10^9$  dynes/cm<sup>2</sup> or more in contact with the semiconductor film, whereby an impurity element in the semiconductor film is gettered into the material.

2. (Previously presented) A method of manufacturing a semiconductor device according to claim 1, wherein said material is formed by LPCVD within a temperature range of between 500 and 900°C.

3. (Previously presented) A method of manufacturing a semiconductor device according to claim 1, wherein said material is formed by LPCVD within a pressure range of between 0.1 and 3 Torr.

4. (Previously presented) A method of manufacturing a semiconductor device according to claim 1, wherein said material is formed by LPCVD with a gas containing chlorine as a material gas.

5. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein said material is a silicon nitride film formed by LPCVD.

6. (Withdrawn) A method of manufacturing a semiconductor device according to claim 5, wherein a composition ratio of N/Si in said silicon nitride film is 1.2 to 1.4.

7. (Currently amended) A method of manufacturing a semiconductor device comprising the steps of: ~~wherein a material formed by LPCVD within a temperature range of between 500 and 900°C is formed in contact with a semiconductor film that is formed on a substrate, whereby an impurity element in said semiconductor film is gettered into said material.~~

forming a semiconductor film over a substrate; and

forming a material in contact with the semiconductor film by LPCVD within a temperature range of between 500 and 900°C, whereby an impurity element in the semiconductor film is gettered into the material.

8. (Currently amended) A method of manufacturing a semiconductor device comprising the steps of: ~~wherein a material formed by LPCVD within a pressure range of between 0.1 and 3 Torr is formed in contact with a semiconductor film that is formed on a substrate, whereby an impurity element in said semiconductor film is gettered into said material.~~

forming a semiconductor film over a substrate; and

forming a material in contact with the semiconductor film by LPCVD within a pressure range of between 0.1 and 3 Torr, whereby an impurity element in the semiconductor film is gettered into the material.

9. (Currently amended) A method of manufacturing a semiconductor device comprising the steps of: ~~wherein a material formed by LPCVD with a gas containing chlorine as a material gas is formed in contact with a semiconductor film that is formed on a substrate, whereby an impurity element in said semiconductor film is gettered into said material.~~

forming a semiconductor film over a substrate; and

forming a material in contact with the semiconductor film by LPCVD with a gas containing chlorine as a material gas, whereby an impurity element in the semiconductor film is gettered into the material.

10. (Withdrawn) A method of manufacturing a semiconductor device, wherein a silicon nitride film having an N/Si composition ratio of between 1.2 and 1.4 is formed in contact with a semiconductor film that is formed on a substrate, whereby an impurity element in said semiconductor film is gettered into said silicon nitride film.

C'  
cont.  
11. (Withdrawn) A method of manufacturing a semiconductor device, wherein a silicon nitride film formed by LPCVD is formed in contact with a semiconductor film that is formed on a substrate, whereby an impurity element in said semiconductor film is gettered into said silicon nitride film.

12. (Withdrawn) A method of manufacturing a semiconductor device according to claim 11, wherein said silicon nitride film is formed within a temperature range of between 500 and 900°C.

13. (Withdrawn) A method of manufacturing a semiconductor device according to claim 11, wherein said silicon nitride film is formed within a pressure range of between 0.1 and 3 Torr.

14. (Withdrawn) A method of manufacturing a semiconductor device according to claim 11, wherein said silicon nitride film is formed with a gas containing chlorine as a material gas.

15. (Withdrawn) A method of manufacturing a semiconductor device according to claim 11, wherein the composition ratio of NSi in said silicon nitride film is between 1.2 and 1.4.

16. (Withdrawn) A method of manufacturing a semiconductor device according to any one of claims 1 and 7 to 11, wherein said impurity element is a metallic element.

17. (Withdrawn) A method of manufacturing a semiconductor device according to any one of claims 1 and 7 to 11, wherein said impurity element is a metallic element which is an element selected from the group consisting of: nickel, iron, cobalt, ruthenium, rhodium,

palladium, osmium, iridium, platinum, copper, and gold.

18. (Withdrawn) A method of manufacturing a semiconductor device according to any one of claims 1 and 7 to 11, wherein said semiconductor film is a non-single crystal semiconductor film.

19. (Withdrawn) A method of manufacturing a semiconductor device according to any one of claims 1 and 7 to 11, wherein said semiconductor film is a crystalline silicon film.

20. (Previously presented) A method of manufacturing a semiconductor device according to claim 4, wherein the gas containing chlorine is a mixture gas that contains any one of  $\text{SiCl}_4$ ,  $\text{SiH}_2\text{Cl}_2$ ,  $\text{SiCl}_3$ , and  $\text{Si}_2\text{Cl}_6$ .

21. (Withdrawn) A method of manufacturing a semiconductor device, wherein after a material is formed in contact with a semiconductor film that is formed on a substrate, heat treatment is performed to thereby set a tensile stress of said material to  $8 \times 10^9$  dynes/cm<sup>2</sup> or more and at the same time an impurity element in said semiconductor film is gettered into said material.

22. (Withdrawn) A method of manufacturing a semiconductor device according to claim 21, wherein the temperature of said heat treatment is 500 to 1000°C.

23. (Withdrawn) A method of manufacturing a semiconductor device according to claim 21 or 22, wherein said heat treatment is performed under an inert gas atmosphere.

24. (Withdrawn) A method of manufacturing a semiconductor device according to claim 23, wherein said inert gas is nitrogen.

25. (Withdrawn) A method of manufacturing a semiconductor device according to claim

C1  
cont.

21, wherein said heat treatment is performed under a pressure of 0.1 to 10 Torr.

26. (Withdrawn) A method of manufacturing a semiconductor device according to claim 21, wherein said material is a silicon nitride film, a silicon nitride oxide film, or a laminate film thereof.

27. (Withdrawn) A method of manufacturing a semiconductor device according to claim 21, wherein said material is formed by plasma CVD.

CI  
cont.  
28. (Withdrawn) A method of manufacturing a semiconductor device according to claim 21, wherein said material is formed by sputtering.

29. (Withdrawn) A method of manufacturing a semiconductor device according to claim 26, wherein the composition ratio of N/Si in the silicon nitride film prior to said heat treatment is between 1.2 and 1.4.

30. (Withdrawn) A method of manufacturing a semiconductor device according to claim 26, wherein the composition ratio of N/Si in the silicon nitride film after said heat treatment is between 1.2 and 1.4.

31. (Withdrawn) A method of manufacturing a semiconductor device, wherein after a material is formed in contact with a semiconductor film that is formed on a substrate, heat treatment is performed to thereby set a composition ratio of N/Si of said material to between 1.2 and 1.4 and at the same time an impurity element in said semiconductor film is gettered into said material.

32. (Withdrawn) A method of manufacturing a semiconductor device according to claim 31, wherein said material is a silicon nitride film, a silicon nitride oxide film, or a laminate film thereof.

33. (Withdrawn) A method of manufacturing a semiconductor device, comprising the steps of:

intentionally introducing a metallic element for promoting crystallization of silicon into an amorphous semiconductor film;

crystallizing said amorphous semiconductor film by performing a first heat treatment to thereby obtain a crystalline semiconductor film; and

forming a silicon nitride film in contact with said crystalline semiconductor film after formation thereof and at the same time gettering said metallic element to said silicon nitride film, whereby the metallic element in said crystalline semiconductor film is removed or reduced.

34. (Withdrawn) A method of manufacturing a semiconductor device, comprising the steps of:

selectively introducing a metallic element for promoting crystallization of silicon into an amorphous semiconductor film;

crystallizing said amorphous semiconductor film by performing a first heat treatment to thereby obtain a crystalline semiconductor film; and

forming a silicon nitride film in contact with said crystalline semiconductor film after formation thereof and at the same time gettering said metallic element to said silicon nitride film, whereby the metallic element in said crystalline semiconductor film is removed or reduced.

35. (Withdrawn) A method of manufacturing a semiconductor device according to claim 33 or 34, wherein said silicon nitride film is formed by LPCVD.

36. (Withdrawn) A method of manufacturing a semiconductor device according to claim 33 or 34, wherein after the formation of said silicon nitride film, said silicon nitride film is removed.

C1  
Cont.

37. (Withdrawn) A method of manufacturing a semiconductor device, comprising the steps of:

intentionally introducing a metallic element for promoting crystallization of silicon into an amorphous semiconductor film;

crystallizing said amorphous semiconductor film by performing a first heat treatment to thereby obtain a crystalline semiconductor film;

forming a silicon nitride film in contact with said crystalline semiconductor film after formation thereof; and

performing a second heat treatment to thereby getter said metallic element to said silicon nitride film, whereby the metallic element in said crystalline semiconductor film is removed or reduced.

38. (Withdrawn) A method of manufacturing a semiconductor device, comprising the steps of:

selectively introducing a metallic element for promoting crystallization of silicon into an amorphous semiconductor film;

crystallizing said amorphous semiconductor film by performing a first heat treatment to thereby obtain a crystalline semiconductor film;

forming a silicon nitride film in contact with said crystalline semiconductor film after formation thereof; and

performing a second heat treatment to thereby getter said metallic element to said silicon nitride film, whereby the metallic element in said crystalline semiconductor film is removed or reduced.

39. (Withdrawn) A method of manufacturing a semiconductor device, comprising the steps of:

intentionally introducing a metallic element for promoting crystallization of silicon into an amorphous semiconductor film;

crystallizing said amorphous semiconductor film by performing a first heat treatment to

C1  
cont.

thereby obtain a crystalline semiconductor film;

forming a silicon oxide film, which has an opening portion, in contact with said crystalline semiconductor film after formation thereof;

forming a silicon nitride film in contact with said opening portion;

performing a second heat treatment to thereby getter said metallic element to said silicon nitride film, whereby the metallic element in said crystalline semiconductor film is removed or reduced; and

patterning the crystalline semiconductor film with said silicon oxide film as a mask.

C1  
Cont. 40. (Withdrawn) A method of manufacturing a semiconductor device, comprising the steps of:

forming a silicon oxide film, which has an opening portion, in contact with an amorphous semiconductor film;

selectively introducing a metallic element for promoting crystallization of silicon to said amorphous semiconductor film with said silicon oxide film as a mask;

crystallizing said amorphous semiconductor film by performing a first heat treatment to thereby obtain a crystalline semiconductor film;

forming a silicon nitride film in contact with said opening portion;

performing a second heat treatment to thereby getter said metallic element to said silicon nitride film, whereby the metallic element in said crystalline semiconductor film is removed or reduced; and

patterning the crystalline semiconductor film with said silicon oxide film as a mask.

41. (Withdrawn) A method of manufacturing a semiconductor device according to any one of claims 37 to 40, wherein said silicon nitride film is removed after performing said second heat treatment.

42. (Withdrawn) A method of manufacturing a semiconductor device according to any one of claims 37 to 40, wherein said second heat treatment sets a tensile stress of said silicon

nitride film to  $8 \times 10^9$  dynes/cm<sup>2</sup> or more.

43. (Withdrawn) A method of manufacturing a semiconductor device according to any one of claims 33, 34 and 37 to 40, wherein said metallic element is an element selected from the group consisting of: nickel, iron, cobalt, ruthenium, rhodium, palladium, osmium, iridium, platinum, copper, and gold.

44. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is intentionally introduced a metallic element for promoting crystallization by performing a heat treatment.

45. (Withdrawn) A method of manufacturing a semiconductor device according to claim 7, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is intentionally introduced a metallic element for promoting crystallization by performing a heat treatment.

46. (Withdrawn) A method of manufacturing a semiconductor device according to claim 8, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is intentionally introduced a metallic element for promoting crystallization by performing a heat treatment.

47. (Withdrawn) A method of manufacturing a semiconductor device according to claim 9, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is intentionally introduced a metallic element for promoting crystallization by performing a heat treatment.

48. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor

C1  
Cont.

film which is intentionally introduced a metallic element for promoting crystallization by performing a heat treatment.

49. (Withdrawn) A method of manufacturing a semiconductor device according to claim 11, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is intentionally introduced a metallic element for promoting crystallization by performing a heat treatment.

C1  
Cont.  
50. (Withdrawn) A method of manufacturing a semiconductor device according to claim 21, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is intentionally introduced a metallic element for promoting crystallization by performing a heat treatment.

51. (Withdrawn) A method of manufacturing a semiconductor device according to claim 31, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is intentionally introduced a metallic element for promoting crystallization by performing a heat treatment.

52. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is selectively introducing a metallic element for promoting crystallization by performing a heat treatment.

53. (Withdrawn) A method of manufacturing a semiconductor device according to claim 7, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is selectively introducing a metallic element for promoting crystallization by performing a heat treatment.

54. (Withdrawn) A method of manufacturing a semiconductor device according to

claim 8, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is selectively introducing a metallic element for promoting crystallization by performing a heat treatment.

55. (Withdrawn) A method of manufacturing a semiconductor device according to claim 9, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is selectively introducing a metallic element for promoting crystallization by performing a heat treatment.

C1  
Cont.  
56. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is selectively introducing a metallic element for promoting crystallization by performing a heat treatment.

57. (Withdrawn) A method of manufacturing a semiconductor device according to claim 11, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is selectively introducing a metallic element for promoting crystallization by performing a heat treatment.

58. (Withdrawn) A method of manufacturing a semiconductor device according to claim 21, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is selectively introducing a metallic element for promoting crystallization by performing a heat treatment.

59. (Withdrawn) A method of manufacturing a semiconductor device according to claim 31, wherein said semiconductor film is formed by crystallizing an amorphous semiconductor film which is selectively introducing a metallic element for promoting crystallization by performing a heat treatment.

60. (Previously presented) A method of manufacturing a semiconductor device according to claim 9, wherein the gas containing chlorine is a mixture gas that contains any one of  $\text{SiCl}_4$ ,  $\text{SiH}_2\text{Cl}_2$ ,  $\text{SiCl}_3$ , and  $\text{Si}_2\text{Cl}_6$ .

61. (Currently amended) A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film over a substrate;

forming a material having a tensile stress of  $8 \times 10^9$  dynes/cm<sup>2</sup> or more in contact with the semiconductor film ~~to getter an impurity element in the semiconductor film therein~~, whereby an impurity element is gettered into the material;

removing the material having a tensile stress of  $8 \times 10^9$  dynes/cm<sup>2</sup> or more from the semiconductor film;

forming a gate insulating film over the semiconductor film;

forming a gate electrode over the gate insulating film.

62. (Currently amended) A method of manufacturing a semiconductor device according to ~~claim 60~~ claim 61, wherein said material is formed by LPCVD within a temperature range of between 500 and 900°C.

63. (Currently amended) A method of manufacturing a semiconductor device according to ~~claim 60~~ claim 61, wherein said material is formed by LPCVD within a pressure range of between 0.1 and 3 Torr.

64. (Currently amended) A method of manufacturing a semiconductor device according to ~~claim 60~~ claim 61, wherein said material is formed by LPCVD with a gas containing chlorine as a material gas.

65. (Currently amended) A method of manufacturing a semiconductor device according to ~~claim 60~~ claim 61, wherein said material is a silicon nitride film formed by LPCVD.

C1  
Cont.

66. (Currently amended) A method of manufacturing a semiconductor device according to ~~claim 64~~ claim 65, wherein a composition ratio of N/Si in said silicon nitride film is 1.2 to 1.4.

67. (New) A method of manufacturing a semiconductor device according to claim 1, wherein the impurity element is a metallic element selected from the group consisting of nickel, iron, cobalt, ruthenium, rhodium, palladium, osmium, iridium, platinum, copper and gold. ✓

*Pa* *Pl*

C' 68. (New) A method of manufacturing a semiconductor device according to claim 7, wherein the impurity element is a metallic element selected from the group consisting of nickel, iron, cobalt, ruthenium, rhodium, palladium, osmium, iridium, platinum, copper and gold.

69. (New) A method of manufacturing a semiconductor device according to claim 8, wherein the impurity element is a metallic element selected from the group consisting of nickel, iron, cobalt, ruthenium, rhodium, palladium, osmium, iridium, platinum, copper and gold.

70. (New) A method of manufacturing a semiconductor device according to claim 9, wherein the impurity element is a metallic element selected from the group consisting of nickel, iron, cobalt, ruthenium, rhodium, palladium, osmium, iridium, platinum, copper and gold. ✓

71. (New) A method of manufacturing a semiconductor device according to claim 61, wherein the impurity element is a metallic element selected from the group consisting of nickel, iron, cobalt, ruthenium, rhodium, palladium, osmium, iridium, platinum, copper and gold. ✓

8156624

6103009